

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2004/015882

**A. CLASSIFICATION OF SUBJECT MATTER**  
Int.Cl' C07C251/08, 251/18, 251/20//C08G73/06

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
Int.Cl' C07C251/08, 251/18, 251/20, C08G73/06

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
CA (STN), REGISTRY (STN)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No. |
|-----------|--|-----------------------|
| X         | JP 62-13406 A (Eniricerche S.p.A.),<br>22 January, 1987 (22.01.87),<br>Full text<br>& EP 207562 A1 & US 4735994 A                | 1                     |
| X, P      | JP 2004-292348 A (Daicel Chemical Industries,<br>Ltd.),<br>21 October, 2004 (21.10.04),<br>& US 2004/0242923 A1                  | 1                     |
| X, P      | JP 2004-307804 A (Daicel Chemical Industries,<br>Ltd.),<br>04 November, 2004 (04.11.04),<br>& US 2004/0175858 A1 & EP 1462471 A1 | 1                     |

 Further documents are listed in the continuation of Box C. See patent family annex.

- \* Special categories of cited documents:
- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier application or patent but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reasons (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "&" document member of the same patent family

Date of the actual completion of the international search  
04 January, 2005 (04.01.05)Date of mailing of the international search report  
25 January, 2005 (25.01.05)Name and mailing address of the ISA/  
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

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## Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(e) for the following reasons:

1.  Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
  
  
2.  Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
  
  
  
3.  Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Compounds capable of forming an insulating polybenzoxazole film and having the partial structure <benzene ring-N=C> are known to persons skilled in the art (JP 2003-156844 A).

In view of this, the technical feature common to the compounds (the choices) of claim 1, i.e., "a compound capable of forming an insulating polybenzoxazole film and having the partial structure <aromatic ring-N=C>, cannot be regarded as "a special technical feature" (a technical feature which clearly shows a contribution made by the invention as a whole to the prior art).

There is hence no technical relationship involving "a special technical (continued to extra sheet)

1.  As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
  
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: part of claim 1

## Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

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Continuation of Box No.III of continuation of first sheet(2)

feature" among the compounds (the choices) of claim 1. The claim does not satisfy the requirement of unity of invention.

(With respect to scope of international search)

Among "compounds of the formula (1) having three or more optionally protected amino groups" which have a special technical feature, the compounds which are described in the description by means of a Production Example/Use Example are limited to "compounds in which R<sup>a</sup> and R<sup>b</sup> each is alkylidene having no polar groups (isopropylidene, cyclohexylidene, etc.), R<sup>c</sup> and R<sup>d</sup> each is alkylidene having no polar groups or monosubstituted amino having no polar groups, and R<sup>a</sup>, R<sup>b</sup>, R<sup>c</sup>, and R<sup>d</sup> are bonded to the 1-, 2-, 4-, and 5-positions of the benzene ring or to the 3-, 3'-, 4-, and 4'-positions of the biphenyl ring." The other compounds (hereinafter referred to as "undisclosed compounds") are not described by means of a Production Example/Use Example.

The undisclosed compounds are not a matter of technical common sense for persons skilled in the field of insulating polybenzazole films.

Furthermore, it cannot be considered that compounds in which R<sup>a</sup> and R<sup>c</sup> are not located in ortho positions to R<sup>b</sup> and R<sup>d</sup>, respectively, react with a carboxylic acid to form an insulating polybenzazole film. It is a matter of course that compounds differing in the positions of the amino groups on the aromatic ring give insulating polybenzazole films differing in structure and property.

In addition, differences in the amounts, kinds, bonding positions, etc. of polar groups and of heteroatoms in the aromatic ring result in a difference in solubility in solvents.

In view of this, it cannot be presumed that the undisclosed compounds have the same solvent solubility and the same property of forming an insulating polybenzazole film as the "compounds in which R<sup>a</sup> and R<sup>b</sup> each is alkylidene having no polar groups (isopropylidene, cyclohexylidene, etc.), R<sup>c</sup> and R<sup>d</sup> each is alkylidene having no polar groups or monosubstituted amino having no polar groups, and R<sup>a</sup>, R<sup>b</sup>, R<sup>c</sup>, and R<sup>d</sup> are bonded to the 1-, 2-, 4-, and 5-positions of the benzene ring or to the 3-, 3'-, 4-, and 4'-positions of the biphenyl ring."

Consequently, among the "compounds of the formula (1) having three or more optionally protected amino groups" of claim 1, the undisclosed compounds are not sufficiently supported by the description.

The undisclosed compounds among the "compounds of the formula (1) having three or more optionally protected amino groups" of claim 1 cannot be clearly judged as to how they have relevance to the prior art (especially inventiveness) because they are not sufficiently supported by the description.

Therefore, an international search report was made only for the "compounds in which R<sup>a</sup> and R<sup>b</sup> each is alkylidene having no polar groups (isopropylidene, cyclohexylidene, etc.), R<sup>c</sup> and R<sup>d</sup> each is alkylidene having no polar groups or monosubstituted amino having no polar groups, and R<sup>a</sup>, R<sup>b</sup>, R<sup>c</sup>, and R<sup>d</sup> are bonded to the 1-, 2-, 4-, and 5-positions of the benzene ring or to the 3-, 3'-, 4-, and 4'-positions of the biphenyl ring."

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